



NOTE TO GENERAL CONTRACTOR

additional antennas be installed without WRITTEN CONSENT FROM TOWER ENGINEER.

STRUCTURAL NOTE:

ADVANTAGE ENGINEERS IS NOT RESPONSIBLE PLEASE REFER TO THE STRUCTURAL ANALYSIS COMPLETED BY OTHERS FOR ALL STRUCTURAL INFORMATION RELATED TO THE ANTENNA MOUNTS

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COMPOUND PLAN

CONSTRUCTION DETAILS

UTILITY ROUTING PLAN & NOTES

SITE PLAN

ELEVATION





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520 FELLOWSHIP ROAD, SUITE A-106 MOUNT LAUREL, NEW JERSEY 08054 PHONE (856) 231-0800

	SCHEDULE OF REVISIONS			
6				
5				
4				
3				
2				
1				
0	07-06-16	JLK	FINAL	
А	07-01-16	LCW	90% REVIEW (COMBO)	
REV NO.	DATE	DRAFTER	DESCRIPTION OF CHANGES	

DRAWN BY:	LCW
CHECKED BY:	TA
SCALE:	NOTED
JOB NO:	M880140.00

1 OF 6

SITE NAME: **US-MA-5025** GRAFTON **SITE ADDRESS: 104 CREEPER HILL ROAD** GRAFTON, **MASSACHUSETTS 01536 JURISDICTION:**

TOWN OF GRAFTON WORCESTER COUNTY, MA

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DRAWING TITLE:

SHEET

DRAWING SHEET:

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TITLE

SHEET NUMBER:

ANDREW M. MILLER, P.E. MASSACHUSETTS PROFESSIONAL ENGINEER

LICENSE # 51675

SITE NAME: GRAFTON US-MA-5025

104 CREEPER HILL ROAD GRAFTON, MASSACHUSETTS 01536

NEW MONOPOLE AND GROUND EQUIPMENT WITHIN THE PROPOSED LEASE AREA



AREA MAP GRAFTON, MASSACHUSETTS

SCALE: 1" = 2000'-0"

DIRECTIONS:

HEADING FROM BOSTON AIRPORT: HEAD NORTHWEST TOWARD E BOSTON GREENWAY. TURN RIGHT ONTO PORTER ST. TURN RIGHT AT THE 1ST CROSS STREET ONTO BREMEN ST. SLIGHT RIGHT ONTO BENNINGTON ST. TURN RIGHT ONTO NEPTUNE RD. TURN RIGHT ONTO THE ROUTE 1 S RAMP TO LOGAN AIRPOIRT/6/BOSTON. MERGE ONTO MA-1A S/STATE HWY 1A S. CONTINUE ONTO I-90 W. KEEP LEFT TO STAY ON I-90 W. KEEP LEFT TO STAY ON I-90 W. TAKE EXIT 11 TOWARD MASSACHUSETTS 122/MILLBURY/WORCESTER. TURN LEFT ONTO MA-122 N/GRAFTON ST. TURN RIGHT ONTO THE US-20 W RAMP. MERGE ONTO US-20 E/SW CUTOFF. TURN RIGHT ONTO WESTBOROUGH ST. CONTINUE ONTO CREEPER HILL RD. THE EXISTING DIRT ACCESS ROAD WILL BE ON THE LEFT.

CODE ANALYSIS

SITE INFORMATION

GRAFTON US-MA-5025

104 CREEPER HILL ROAD GRAFTON MASSACHUSETTS, 01536

OLI-OFFICE LIGHT INDUSTRIAL

GRAF-000017-000000-000008A

662,112 S.F. / 10,000 S.F.

N 42° 14' 18.7" (NAD 83) W 71° 43' 42.8" (NAD 83)

TOWN OF GRAFTON

VERTICAL BRIDGE

(561) 948-6367

359'± (NAVD 88)

MONOPOLE

120'-0"± AGL

TOWN OF GRAFTON WORCESTER COUNTY, MASSACHUSETTS

180'-0"± AGL (TOP OF LIGHTNING ROD)

30 PROVIDENCE ROAD GRAFTON, MASSACHUSETTS 01519

750 PARK OF COMMERCE DRIVE, SUITE 200 BOCA RATON, FLORIDA 33487

VERTICAL BRIDGE 750 PARK OF COMMERCE DRIVE, SUITE 200 BOCA RATON, FLORIDA 33487

SITE NAME:

SITE ADDRESS

JURISDICTION:

TAX ACCOUNT ID:

SITE COORDINATES:

GROUND ELEVATION:

STRUCTURE HEIGHT:

ANTENNA RAD CENTER:

GROUND LANDLORD NAME:

GROUND LANDLORD ADDRESS:

STRUCTURE TYPE:

LANDLORD NAME:

APPLICANT:

LANDLORD ADDRESS:

APPLICANT PHONE:

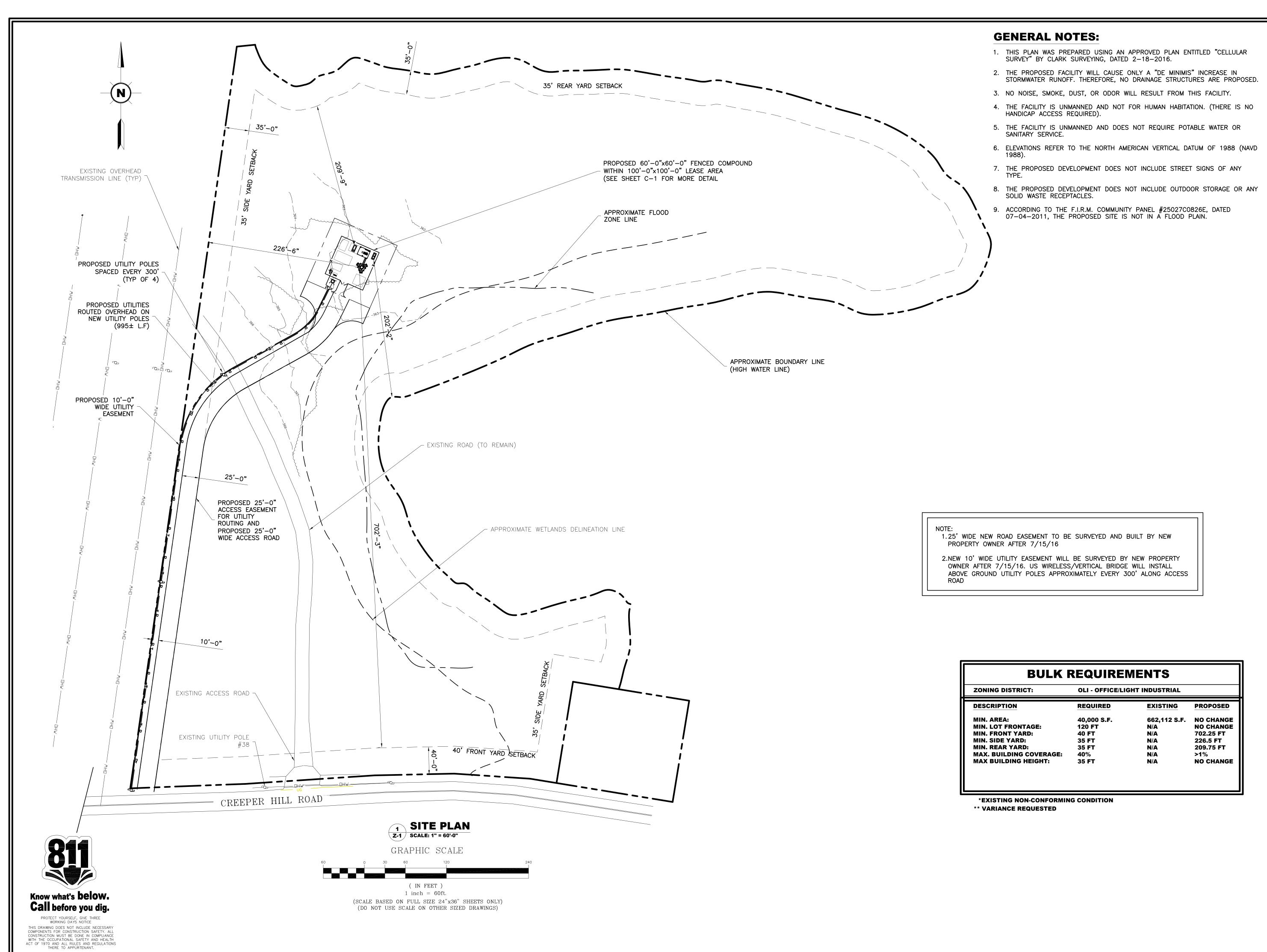
PARCEL SIZE / COMPOUND SIZE:

ZONING:

BUILDING CODE: IBC 2009 **ELECTRICAL CODE:** NEC 2014 FIRE CODE: IFC 2009 USE GROUP: U (UTILITY) CONSTRUCTION TYPE:

PROJECT DESCRIPTION

- 1. NEW MONOPOLE TO BE INSTALLED.
- 2. NEW 10,000 S.F. TELECOMMUNICATIONS COMPOUND TO BE INSTALLED.
- 3. NEW POWER AND TELCO EQUIPMENT TO BE INSTALLED WITHIN



vertical bridge
750 PARK OF COMMERCE DRIVE, SUITE 200
BOCA RATON, FLORIDA 33487
PHONE: (561) 948-6367



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SITE PLAN

DRAWING SHEET:

Z-1

SHEET NUMBER:

2 **OF** 6

SITE INFORMATION:

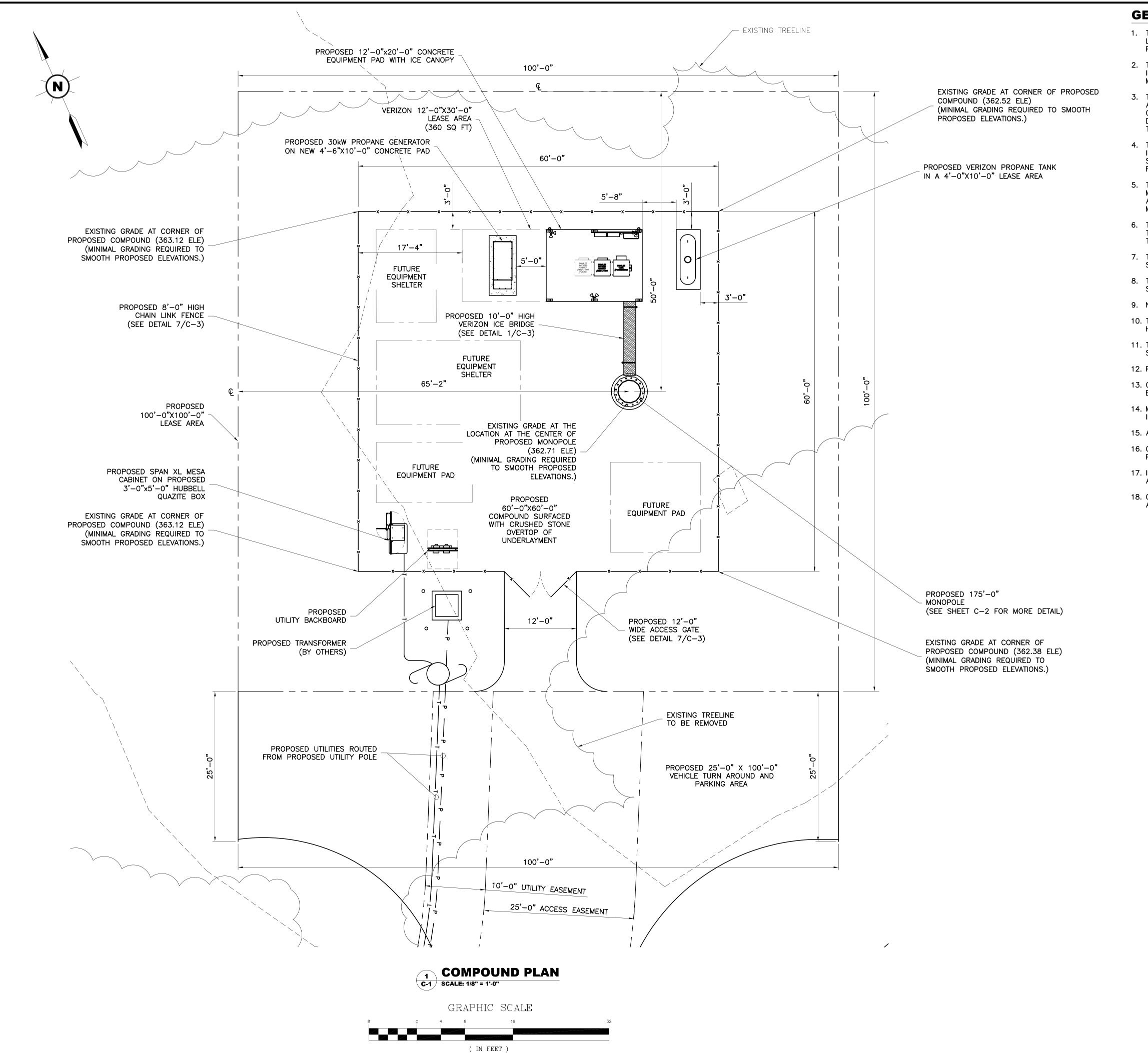
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GRAFTON,
MASSACHUSETTS 01536
JURISDICTION:

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WORCESTER COUNTY, MA

ANDREW M. MILLER, P.E.

MASSACHUSETTS PROFESSIONAL ENGINEER
LICENSE # 51675



1/8 inch = 1 ft.

(SCALE BASED ON FULL SIZE 24"x36" SHEETS ONLY)
(DO NOT USE SCALE ON OTHER SIZED DRAWINGS)

GENERAL NOTES

- 1. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES, ORDINANCES, LAWS AND REGULATIONS OF ALL MUNICIPALITIES, UTILITY COMPANIES OR OTHER PUBLIC AUTHORITIES.
- 2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS THAT MAY BE REQUIRED BY ANY FEDERAL, STATE, COUNTY OR MUNICIPAL AUTHORITIES.
- 3. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER, IN WRITING, OF ANY CONFLICTS, ERRORS OR OMISSIONS PRIOR TO THE SUBMISSION OF BIDS OR PERFORMANCE OF WORK. MINOR OMISSIONS OR ERRORS IN THE BID DOCUMENTS SHALL NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR THE OVERALL INTENT OF THESE DRAWINGS.
- 4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING SITE IMPROVEMENTS PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED AS A RESULT OF CONSTRUCTION OF THIS FACILITY.
- 5. THE SCOPE OF WORK FOR THIS PROJECT SHALL INCLUDE PROVIDING ALL MATERIALS, EQUIPMENT AND LABOR REQUIRED TO COMPLETE THIS PROJECT. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
- 6. THE CONTRACTOR SHALL VISIT THE PROJECT SITE PRIOR TO SUBMITTING A BID TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
- 7. THIS PLAN WAS PREPARED USING AN APPROVED PLAN ENTITLED "CELLULAR SURVEY" BY CLARK SURVEYING, DATED 2-18-2016.
- 8. THE PROPOSED FACILITY WILL CAUSE ONLY A "DE MINIMIS" INCREASE IN STORMWATER RUNOFF. THEREFORE, NO DRAINAGE STRUCTURES ARE PROPOSED.
- 9. NO NOISE, SMOKE, DUST, OR ODOR WILL RESULT FROM THIS FACILITY.
- 10. THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION (THERE IS NO HANDICAP ACCESS REQUIRED).
- 11. THE FACILITY IS UNMANNED AND DOES NOT REQUIRE POTABLE WATER OR SANITARY SERVICE.
- 12. POWER TO THE FACILITY WILL BE MONITORED BY A SEPARATE METER.
- 13. CONTRACTOR SHALL VERIFY ANTENNA ELEVATION AND AZIMUTH WITH RF ENGINEERING PRIOR TO INSTALLATION.
- 14. MOUNTS AND ANTENNAS ARE DESIGNED TO MEET ANSI/TIA-222-G-2 AS PER IBC 2009 REQUIREMENTS.
- 15. ALL STRUCTURAL ELEMENTS SHALL BE HOT DIPPED GALVANIZED STEEL.
- 16. CONTRACTOR SHALL MAKE A UTILITY "ONE CALL" TO LOCATE ALL UTILITIES PRIOR TO EXCAVATING.
- 17. IF ANY PIPING EXISTS BENEATH THE SITE AREA, CONTRACTOR MUST LOCATE IT AND CONTACT OWNERS REPRESENTATIVE.
- 18. CONSTRUCTION TO COMMENCE UPON COMPLETION OF A PASSING STRUCTURAL ANALYSIS. STRUCTURAL ANALYSIS TO BE PERFORMED BY OTHERS.





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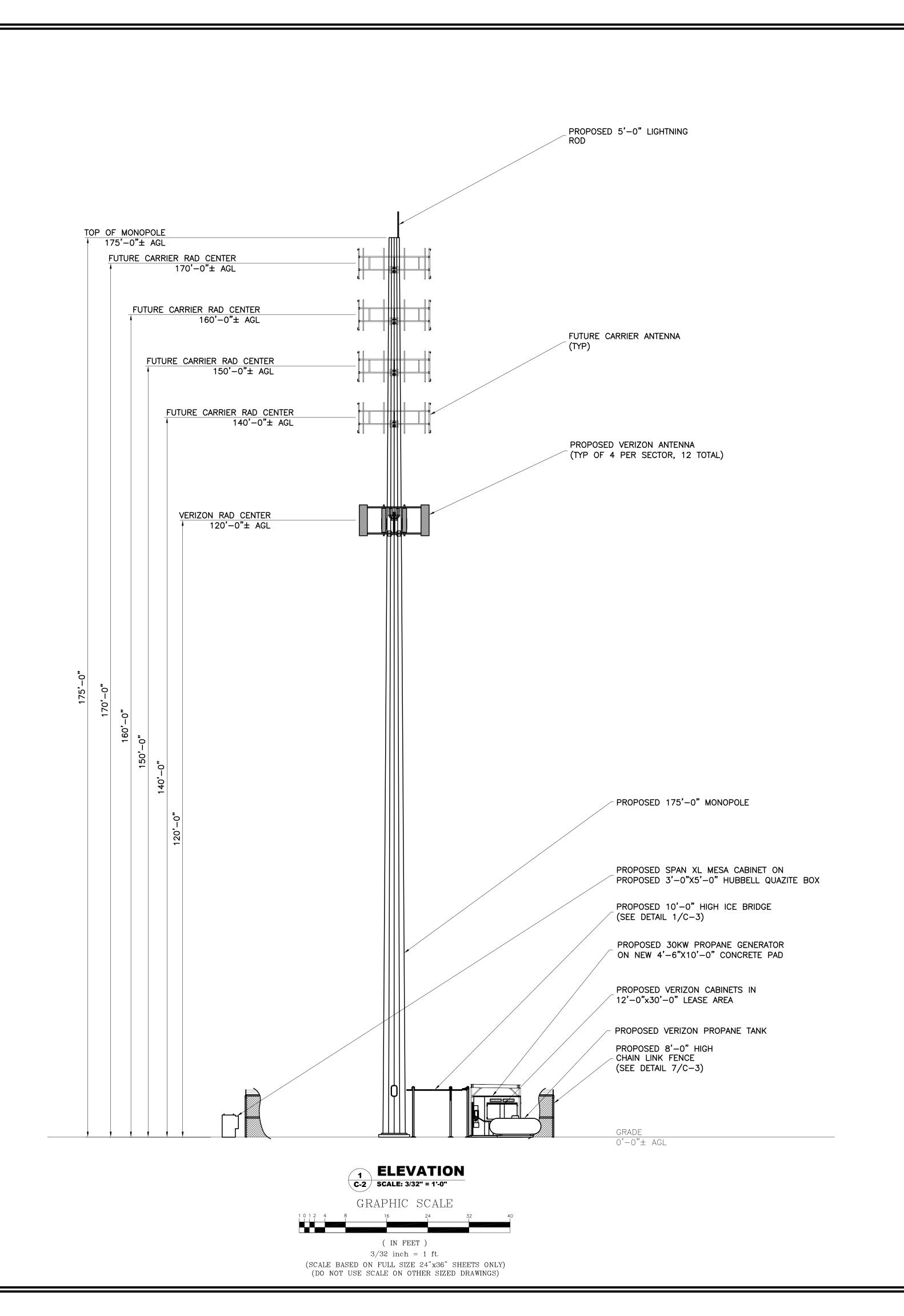
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GRAFTON
SITE ADDRESS:
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GRAFTON,
MASSACHUSETTS 01536
JURISDICTION:
TOWN OF GRAFTON
WORCESTER COUNTY, MA



PROTECT YOURSELF, GIVE THREE
WORKING DAYS NOTICE

THIS DRAWING DOES NOT INCLUDE NECESSARY
COMPONENTS FOR CONSTRUCTION SAFETY. ALL
CONSTRUCTION MUST BE DONE IN COMPLIANCE
WITH THE OCCUPATIONAL SAFETY AND HEALTH
ACT OF 1970 AND ALL RULES AND REGULATIONS
THERE TO APPURTENANT.

ANDREW M. MILLER, P.E.
MASSACHUSETTS PROFESSIONAL ENGINEER
LICENSE # 51675







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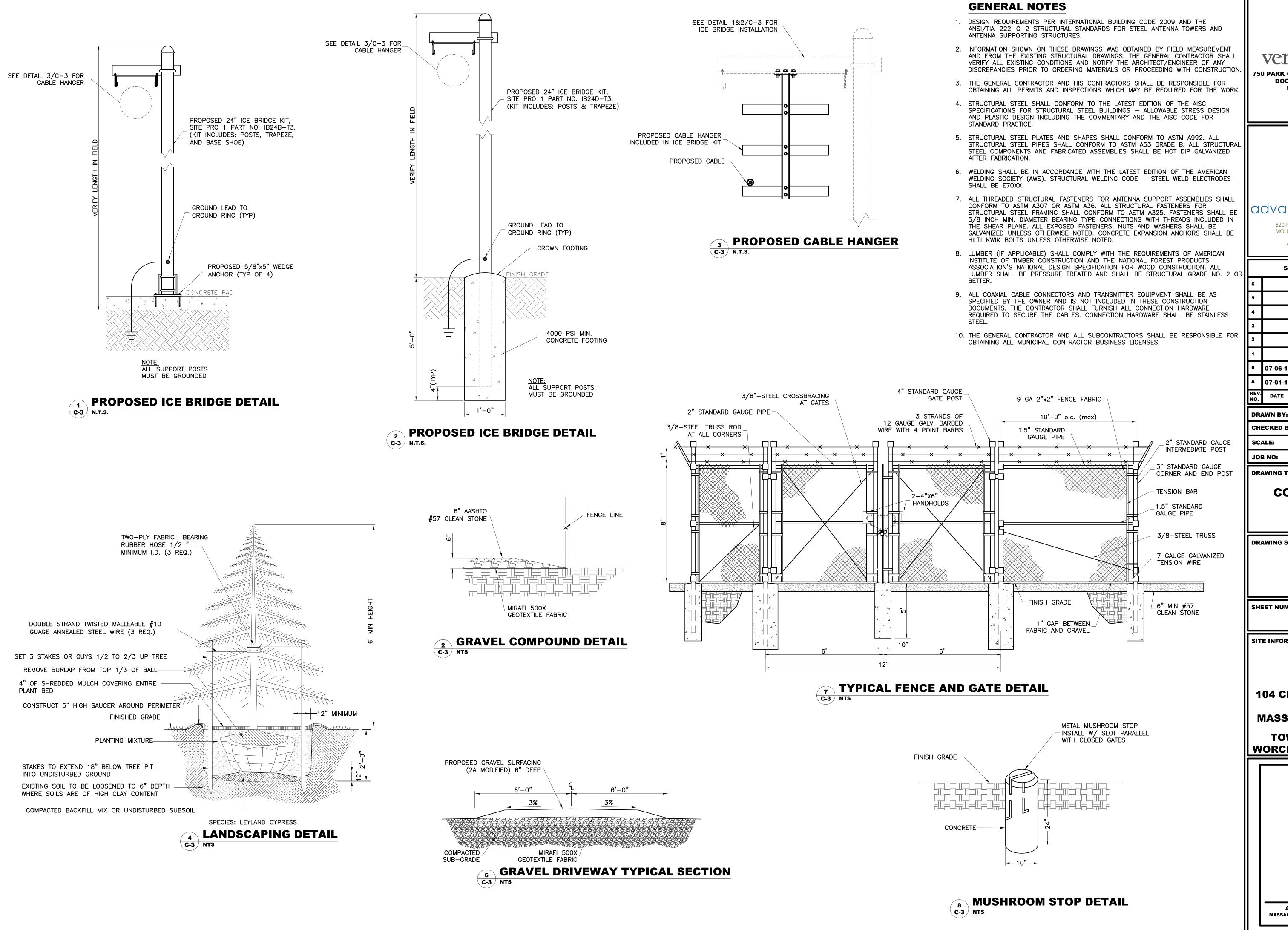
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750 PARK OF COMMERCE DRIVE, SUITE 200 **BOCA RATON, FLORIDA 33487** PHONE: (561) 948-6367



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CONSTRUCTION **DETAILS**

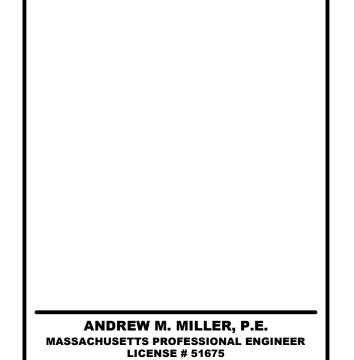
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ELECTRICAL NOTES:

- CONTRACTOR SHALL INSPECT THE EXISTING CONDITIONS PRIOR TO SUBMITTING BID. ANY QUESTIONS ARISING DURING THE BID PERIOD IN REGARDS TO THE CONTRACTORS FUNCTIONS, THE SCOPE OF WORK, OR ANY OTHER ISSUE RELATED TO THIS PROJECT SHALL BE BROUGHT UP DURING THE BID PERIOD WITH THE PROJECT MANAGER FOR CLARIFICATION. NOT AFTER THE CONTRACT HAS BEEN AWARDED.
- LOCATION OF EQUIPMENT, CONDUIT AND DEVICES SHOWN ON THE DRAWINGS ARE APPROXIMATE AND SHALL BE COORDINATED WITH FIELD CONDITIONS PRIOR TO ROUGH-IN.
- THE CONDUIT RUNS AS SHOWN ON THE PLANS ARE APPROXIMATE. EXACT LOCATION AND ROUTING SHALL BE PER EXISTING FIELD CONDITIONS.
- PROVIDE PULL BOXES AND JUNCTION BOXES WHERE SHOWN OR REQUIRED BY
- ALL CONDUITS SHALL BE MET WITH BENDS MADE IN ACCORDANCE WITH NEC CHAPTER 9, TABLE #2. NO RIGHT ANGLE DEVICE OTHER THAN STANDARD CONDUIT ELBOWS WITH 12" MINIMUM INSIDE SWEEPS FOR ALL CONDUITS 2"
- ALL CONDUIT TERMINATIONS SHALL BE PROVIDED WITH PLASTIC THROAT INSULATING GROUNDING BUSHINGS.
- ALL WIRE SHALL BE TYPE THHN/THWN, SOLID, ANNEALED COPPER UP TO SIZE #10 AWG (#8 AND LARGER SHALL BE CONCENTRIC STRANDED) 75°C (167°F), 98% CONDUCTIVITY, MINIMUM #12.
- ALL WIRES SHALL BE TAGGED AT ALL PULL BOXES, J-BOXES, EQUIPMENT BOXES AND CABINETS WITH APPROVED PLASTIC TAGS, ACTION CRAFT, BRADY, OR APPROVED EQUAL.
- ALL NEW MATERIAL SHALL HAVE A U.L. LABEL.
- 10. CONDUIT ROUGH-IN SHALL BE COORDINATED WITH THE MECHANICAL EQUIPMENT TO AVOID LOCATION TO CONFLICTS. VERIFY WITH MECHANICAL CONTRACTOR AND COMPLY AS REQUIRED.
- 11. ALL PANEL DIRECTORIES SHALL BE TYPEWRITTEN NOT HAND WRITTEN.
- 12. INSTALL AN EQUIPMENT GROUNDING CONDUCTOR IN ALL CONDUITS PER THE SPECIFICATIONS AND NEC. THE EQUIPMENT GROUNDING CONDUCTORS SHALL BE BONDED AT ALL JUNCTION BOXES, PULL BOXES, AND ALL DISCONNECT SWITCHES, STARTERS, AND EQUIPMENT CABINETS.
- 13. THE CONTRACTOR SHALL PREPARE AS-BUILT DRAWINGS, DOCUMENT ANY AND ALL WIRING AND EQUIPMENT CONDITIONS AND CHANGES WHILE COMPLETING THIS CONTRACT. SUBMIT AT SUBSTANTIAL COMPLETION.
- 14. ALL DISCONNECT SWITCHES AND OTHER CONTROLLING DEVICES SHALL BE PROVIDED WITH ENGRAVED LAMICOID NAMEPLATES INDICATING EQUIPMENT CONTROLLED, BRANCH CIRCUITS INSTALLED ON, AND PANEL FIELD LOCATIONS FED FROM (NO EXCEPTIONS.)
- 15. ALL ELECTRICAL DEVICES AND INSTALLATIONS OF THE DEVICES SHALL COMPLY WITH (ADA) AMERICANS WITH DISABILITIES ACT AS ADOPTED BY THE APPLICABLE STATE.
- 16. PROVIDE CORE DRILLING AS NECESSARY FOR PENETRATIONS OR RISERS THROUGH BUILDING. DO NOT PENETRATE STRUCTURAL MEMBERS WITHOUT CONSTRUCTION MANAGERS APPROVAL. SLEEVES AND/OR PENETRATIONS IN FIRE RATED CONSTRUCTION SHALL BE PACKED WITH FIRE RATED MATERIAL WHICH SHALL MAINTAIN THE FIRE RATING OF THE WALL OR STRUCTURE. FILL FOR FLOOR PENETRATIONS SHALL PREVENT PASSAGE OF WATER, SMOKE, FIRE AND FUMES. ALL MATERIAL SHALL BE UL APPROVED FOR THIS PURPOSE.
- 17. ELECTRICAL CHARACTERISTICS OF ALL EQUIPMENT (NEW AND EXISTING) SHALL BE FIELD VERIFIED WITH THE OWNER'S REPRESENTATIVE AND EQUIPMEN' SUPPLIER PRIOR TO ROUGH-IN OF CONDUIT AND WIRE. ALL EQUIPMENT SHALL BE PROPERLY CONNECTED ACCORDING TO THE NAMEPLATE DATA FURNISHED ON THE EQUIPMENT (THE DESIGN OF THESE PLANS ARE BASED UPON BEST AVAILABLE INFORMATION AT THE TIME OF DESIGN AND SOME EQUIPMENT CHARACTERISTICS MAY VARY FROM DESIGN AS SHOWN ON THESE DRAWINGS). LOCATION OF ALL OUTLET, BOXES, ETC., AND THE TYPE OF CONNECTION (PLUG OR DIRECT) SHALL BE CONFIRMED WITH THE OWNER'S REPRESENTATIVE PRIOR TO ROUGH-IN.

ELECTRICAL & GROUND SYMBOLS:

GROUND ROD WITH ACCESS

XIT GROUND ROD

5/8"x10'-0" GALVANIZED GROUND ROD

DISCONNECT SWITCH METER ON METER/BREAKER UNIT

CIRCUIT BREAKER

GENERATOR

MECHANICAL TYPE CONNECTION

CADWELD TYPE CONNECTION

GROUNDING WIRE

CB INTERLOCKING MECHANISM

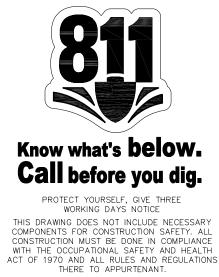
- POWER WIRE/CONDUIT

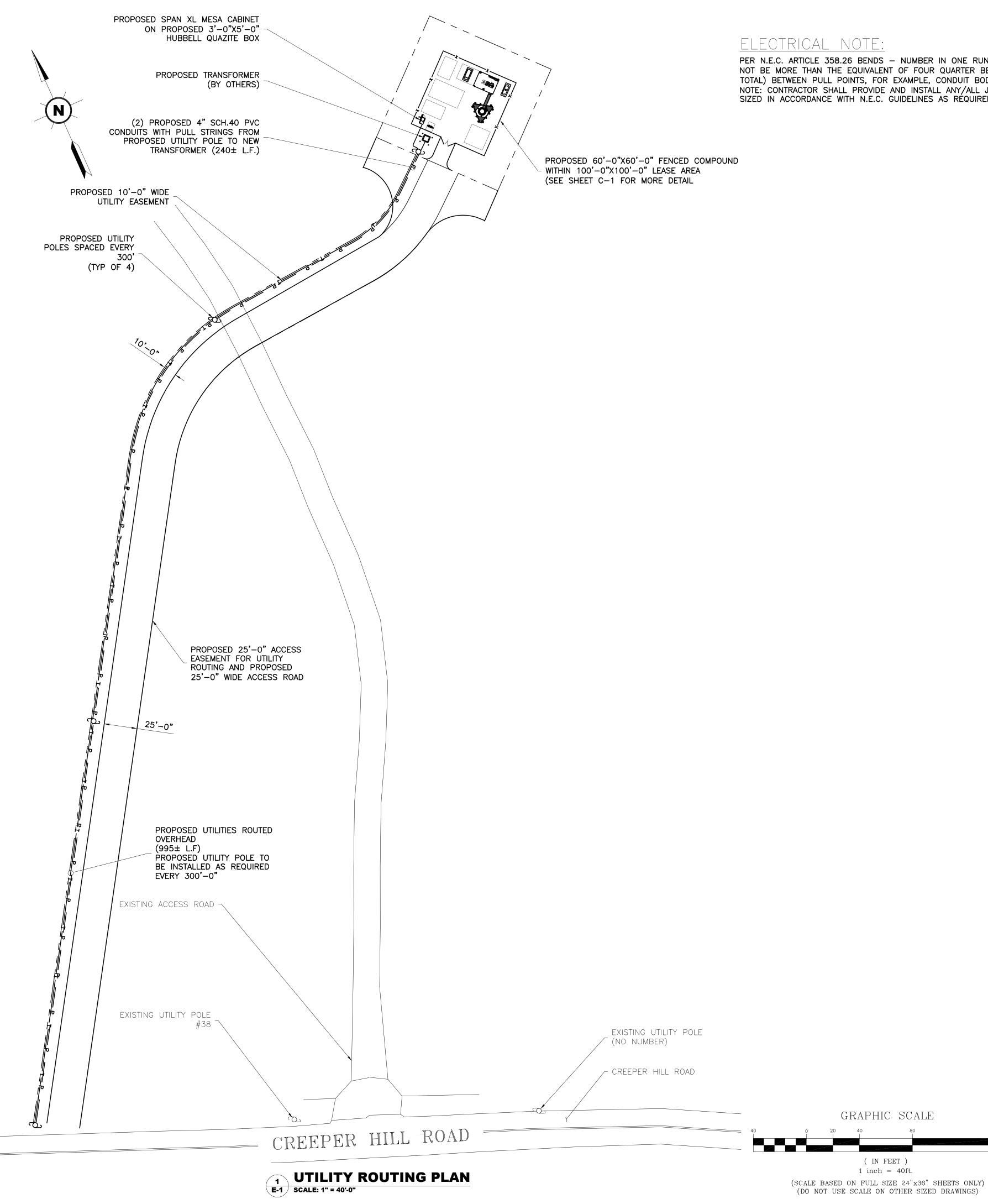
-- -- TELCO FIBER/CONDUIT

ABBREVIATIONS:

AMERICAN WIRE GAUGE BARE COPPER TINNED WIRE **BCTW** GPS GLOBAL POSITIONING SYSTEM PCS PERSONAL COMMUNICATION SYSTEM PPC POWER PROTECTION CABINET PRC PRIMARY RADIO CABINET RWY RACEWAY TYP TYPICAL RGS RIGID GALVANIZED STEEL EMT ELECTRICAL METALLIC TUBING DWG DRAWING IGR INTERIOR GROUND RING (HALO) ANTENNA CABLE COVER ASSEMBLY MIGB MASTER ISOLATED GROUND BAR CIBGE COAX ISOLATED GROUND BAR EXTERNAL BTS BASE TRANSMISSION SYSTEM GEN GENERATOR

STRANDED INSULATED COPPER WIRE





PER N.E.C. ARTICLE 358.26 BENDS - NUMBER IN ONE RUN. THERE SHALL NOT BE MORE THAN THE EQUIVALENT OF FOUR QUARTER BENDS (360 DEGREES TOTAL) BETWEEN PULL POINTS, FOR EXAMPLE, CONDUIT BODIES AND BOXES. NOTE: CONTRACTOR SHALL PROVIDE AND INSTALL ANY/ALL JUNCTION BOXES SIZED IN ACCORDANCE WITH N.E.C. GUIDELINES AS RÉQUIRED FOR THE INSTALLATION. 750 PARK OF COMMERCE DRIVE, SUITE 200 **BOCA RATON, FLORIDA 33487** PHONE: (561) 948-6367



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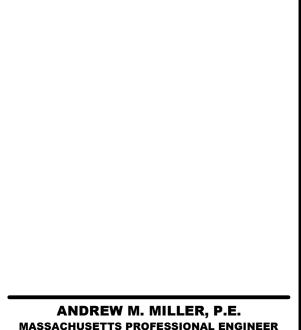


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